

Abstract

Methods and apparatus are provided for automatically tuning a charged particle beam system, such as an ion implanter. In one embodiment, a control parameter of a control component located upstream of a target component is modulated, and the beam current downstream of the target component is measured. The beam current measurements provide information that is used to evaluate tuning and, if necessary, to adjust the target component. The target component is typically a slow response component, such as a magnet. In another embodiment, evaluation of tuning is performed by modulating the target parameter and monitoring the effect of such modulation on the beam current. In a further embodiment, the spot size of the charged particle beam is evaluated by scanning the beam across the edge of an aperture and evaluating the sharpness of the beam focus. The tuning algorithms are preferably implemented in localized power supply interfaces for high speed operation.